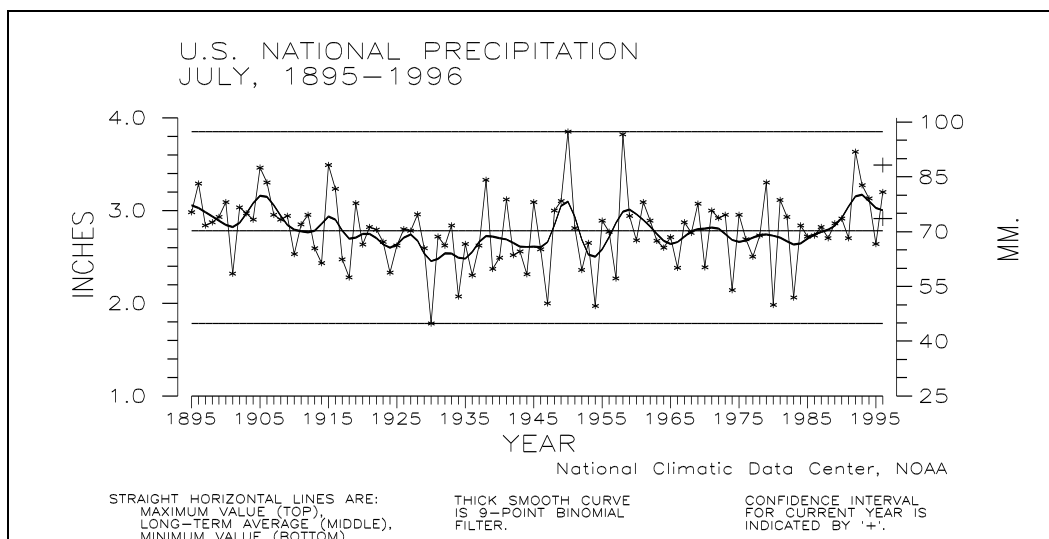
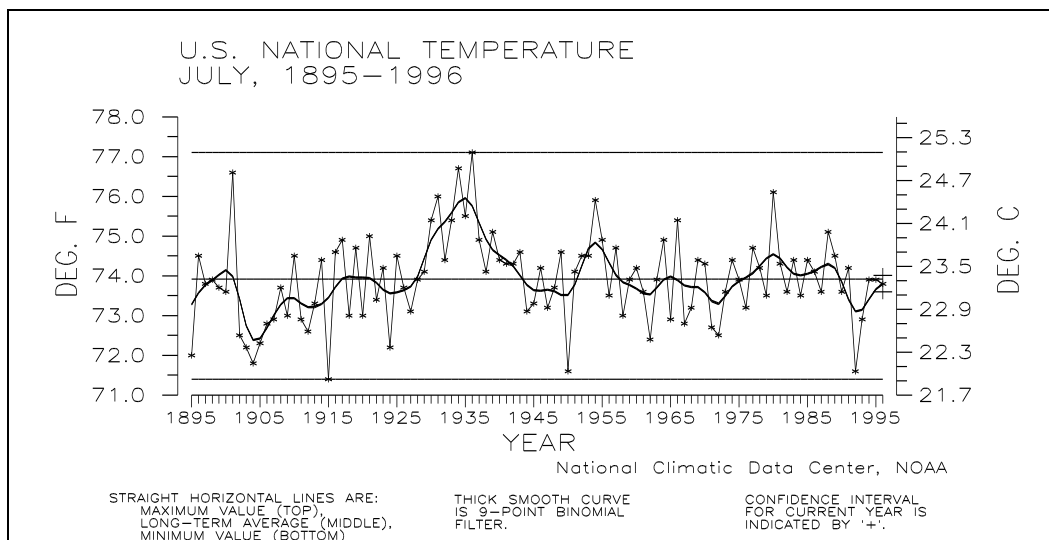


# CLIMATE VARIATIONS BULLETIN



This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from River Forecast Center stations and First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Prediction Center (formerly, Climate Analysis Center), and preliminary tornado statistics obtained from the NWS National Severe Storms Forecast Center. THE CURRENT DATA SHOULD BE USED WITH CAUTION. These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), the hurricane datasets (TD-9636 and TD-9697), the tornado dataset (STORM DATA), and the monthly station dataset (LCD supplemental files). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

If you have access to the Internet, copies of the CVB are available via both the NCDC's World Wide Web (WWW) server and the NCDC's anonymous FTP server.

NCDC's WWW server

URL for the CVB: <http://www.ncdc.noaa.gov/publications/cvb/cvb.html>

NCDC's anonymous FTP server

Machine: <ftp.ncdc.noaa.gov>

Directory: [/pub/data/cvb](ftp://ftp.ncdc.noaa.gov/pub/data/cvb)

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 704-271-4994 or fax a letter to 704-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 704-271-4800 or sending a fax to 704-271-4876 or by writing to:

National Climatic Data Center, NOAA  
Federal Building  
151 Patton Avenue, Room 120  
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

# UNITED STATES JULY CLIMATE IN HISTORICAL PERSPECTIVE

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Federal Building  
Asheville, NC 28801 USA

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TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED  
ON THE PERIOD 1895-1996. 1 = DRIEST/COLDEST,  
102 = WARMEST FOR JULY 1996 TEMPERATURES,  
102 = WETTEST/WARMEST FOR FEB-JUL 1996,  
101 = WETTEST/WARMEST FOR AUG 1995-JUL 1996.  
PRESENT MONTH PRECIPITATION EXPRESSED CATEGORICALLY:  
WET = WET 1/3 OF THE HISTORICAL DISTRIBUTION,  
MID = WITHIN THE MIDDLE 1/3 OF THE DISTRIBUTION,  
DRY = DRY 1/3 OF THE HISTORICAL DISTRIBUTION.

REGION	JULY 1996	FEB-JUL 1996	AUG 1995- JUL 1996
-----	----	-----	-----
PRECIPITATION:			
NORTHEAST	WET	100	98
EAST NORTH CENTRAL	MID	55	84
CENTRAL	WET	88	66
SOUTHEAST	MID	35	72
WEST NORTH CENTRAL	MID	33	48
SOUTH	WET	8	6
SOUTHWEST	MID	22	9
NORTHWEST	MID	94	97
WEST	DRY	76	52
NATIONAL	WET	50	47
TEMPERATURE:			
NORTHEAST	12	28	20
EAST NORTH CENTRAL	9	9	10
CENTRAL	6	18	18
SOUTHEAST	49	21	13
WEST NORTH CENTRAL	42	38	36
SOUTH	51	68	64
SOUTHWEST	90	101	100
NORTHWEST	89	62	78
WEST	94	97	100
NATIONAL	45	59	58

TABLE 2.

STATISTICS FOR SELECTED RIVER BASINS:  
 AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR  
 EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT  
 OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM  
 (PALMER) WET CONDITIONS, AS OF JULY 1996.  
 RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER  
 RESOURCES COUNCIL.

RIVER BASIN -----	% AREA DRY -----	% AREA WET -----
MISSOURI BASIN	.0%	29.7%
PACIFIC NORTHWEST BASIN	.0%	41.3%
CALIFORNIA RIVER BASIN	28.8%	28.0%
GREAT BASIN	37.2%	18.2%
UPPER COLORADO BASIN	25.0%	.0%
LOWER COLORADO BASIN	88.5%	.0%
RIO GRANDE BASIN	47.3%	.0%
ARKANSAS-WHITE-RED BASIN	8.4%	.0%
TEXAS GULF COAST BASIN	90.7%	.0%
SOURIS-RED-RAINY BASIN	.0%	71.2%
UPPER MISSISSIPPI BASIN	.0%	15.1%
LOWER MISSISSIPPI BASIN	.0%	.0%
GREAT LAKES BASIN	.0%	37.3%
OHIO RIVER BASIN	.0%	43.8%
TENNESSEE RIVER BASIN	.0%	.0%
NEW ENGLAND BASIN	.0%	77.2%
MID-ATLANTIC BASIN	.0%	37.3%
SOUTH ATLANTIC-GULF BASIN	.0%	.0%

TABLE 3. EXTREMES, 1961-90 NORMALS, AND 1996 VALUES FOR JULY. IT SHOULD BE NOTED THAT THE 1996 VALUES WILL CHANGE DUE TO THE USE OF A DENSER STATION NETWORK.

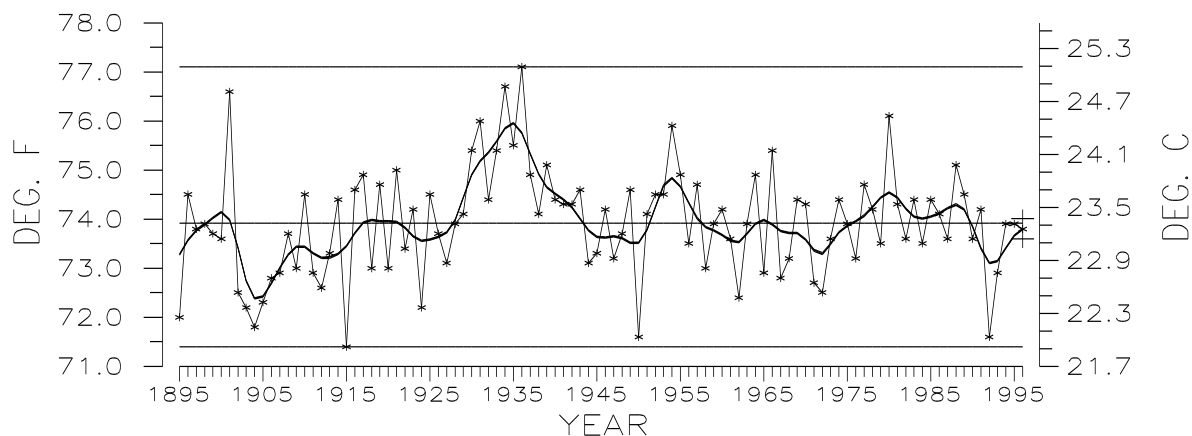
REGION	PRECIPITATION (INCHES)				1996
	DRIEST	WETTEST	NORMAL		
-----	VALUE	YEAR	VALUE	YEAR	PCPN
-----	-----	-----	-----	-----	-----
NORTHEAST	2.02	1968	6.57	1897	3.81
EAST NORTH CENTRAL	.85	1936	6.13	1993	3.61
CENTRAL	1.47	1930	8.27	1958	4.25
SOUTHEAST	2.94	1983	11.55	1916	5.56
WEST NORTH CENTRAL	.84	1917	5.56	1993	2.02
SOUTH	1.34	1980	6.04	1950	3.03
SOUTHWEST	1.00	1993	3.51	1911	1.83
NORTHWEST	.16	1953	2.05	1983	.73
WEST	.00	1903	1.18	1984	.34
NATIONAL	1.78	1930	3.85	1950	2.74

\* PRELIMINARY VALUE, CONFIDENCE  
INTERVAL + OR - .29 INCHES

REGION	TEMPERATURE (DEGREES F)				1996
	COLDEST	WARMEST	NORMAL		
-----	VALUE	YEAR	VALUE	YEAR	TEMP
-----	-----	-----	-----	-----	-----
NORTHEAST	66.1	1962	73.8	1955	69.3
EAST NORTH CENTRAL	64.0	1992	76.2	1936	70.2
CENTRAL	71.9	1947	81.2	1901	75.3
SOUTHEAST	76.3	1947	82.7	1993	78.6
WEST NORTH CENTRAL	62.7	1915	77.4	1936	69.5
SOUTH	78.0	1906	85.9	1980	81.3
SOUTHWEST	70.1	1912	75.9	1901	73.6
NORTHWEST	58.9	1993	70.6	1906	65.9
WEST	69.0	1903	78.2	1931	73.8
NATIONAL	71.4	1915	77.1	1936	73.9

\* PRELIMINARY VALUE, CONFIDENCE  
INTERVAL + OR - .2 DEG. F.

# U.S. NATIONAL TEMPERATURE JULY, 1895-1996



National Climatic Data Center, NOAA

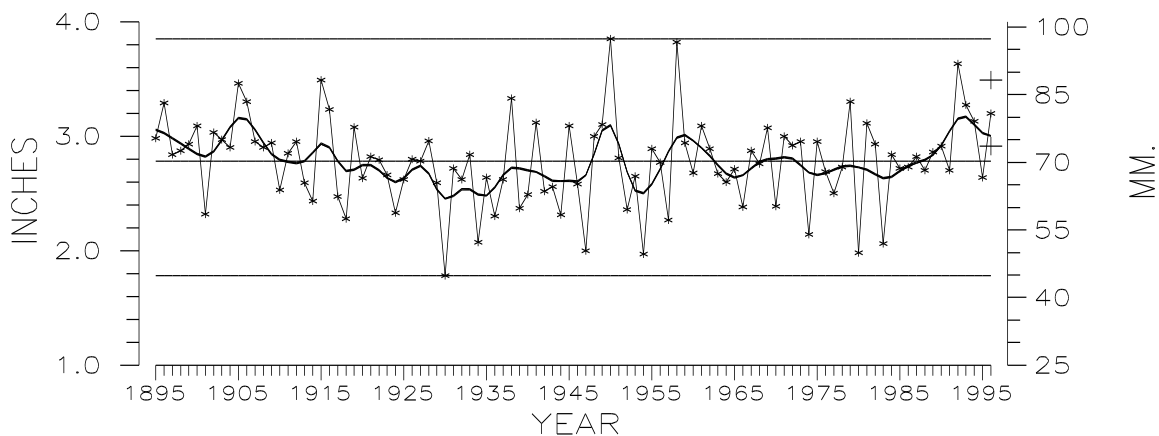
STRAIGHT HORIZONTAL LINES ARE:  
MAXIMUM VALUE (TOP),  
LONG-TERM AVERAGE (MIDDLE),  
MINIMUM VALUE (BOTTOM)

THICK SMOOTH CURVE  
IS 9-POINT BINOMIAL  
FILTER.

CONFIDENCE INTERVAL  
FOR CURRENT YEAR IS  
INDICATED BY '+'.

Figure 1: Preliminary data for July 1996 indicate that temperature averaged across the contiguous United States was below the long-term mean ranking as the 45th coolest July since 1895. Over fourteen percent of the country averaged much cooler than normal while 12.5% of the country averaged much warmer than normal.

# U.S. NATIONAL PRECIPITATION JULY, 1895-1996



National Climatic Data Center, NOAA

STRAIGHT HORIZONTAL LINES ARE:  
MAXIMUM VALUE (TOP),  
LONG-TERM AVERAGE (MIDDLE),  
MINIMUM VALUE (BOTTOM)

THICK SMOOTH CURVE  
IS 9-POINT BINOMIAL  
FILTER.

CONFIDENCE INTERVAL  
FOR CURRENT YEAR IS  
INDICATED BY '+'.

Figure 2: July 1996 was the 12th wettest such month since 1895. About fourteen percent of the country experienced much wetter than normal conditions while about two percent was much drier than normal.

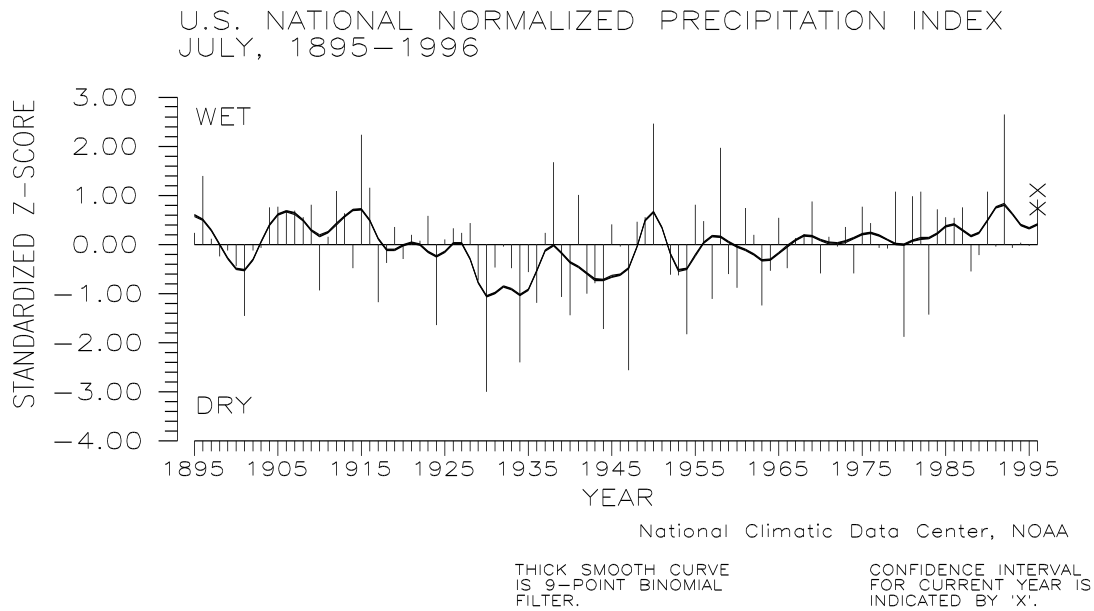


Figure 3: The preliminary national standardized precipitation index ranked July 1996 as the fourteenth wettest such month on record. This standardized z-score is estimated to be accurate to within 0.188 index units and its confidence interval is shown as an 'X'.

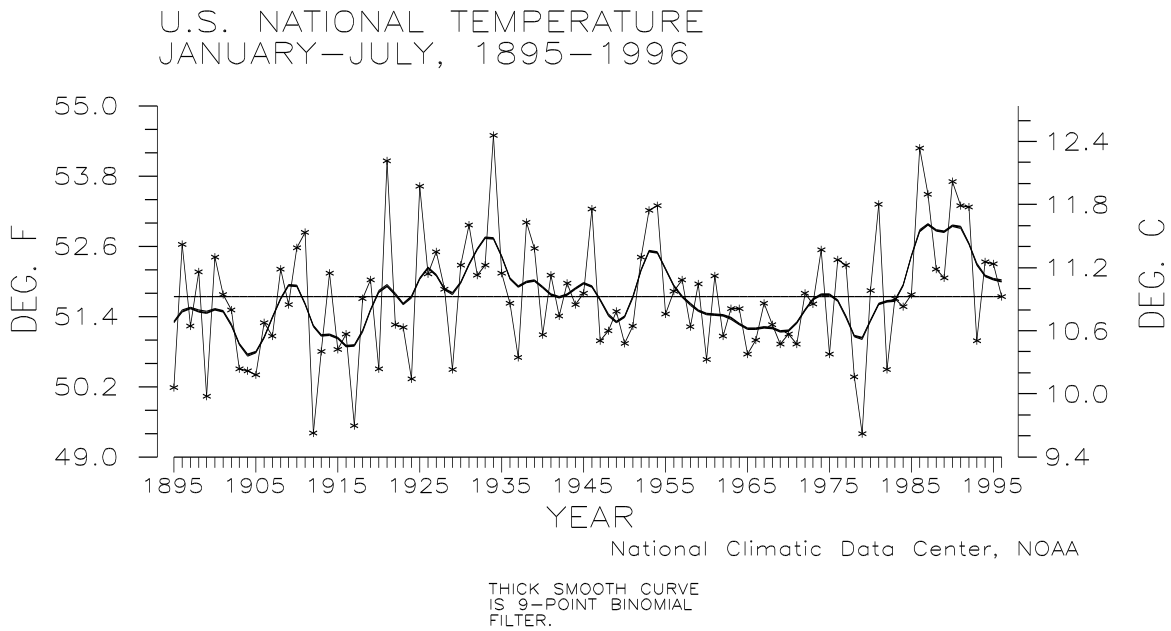


Figure 4: National averaged temperature for the seven-month period was at the long-term mean ranking as the 50th warmest January–July since 1895.



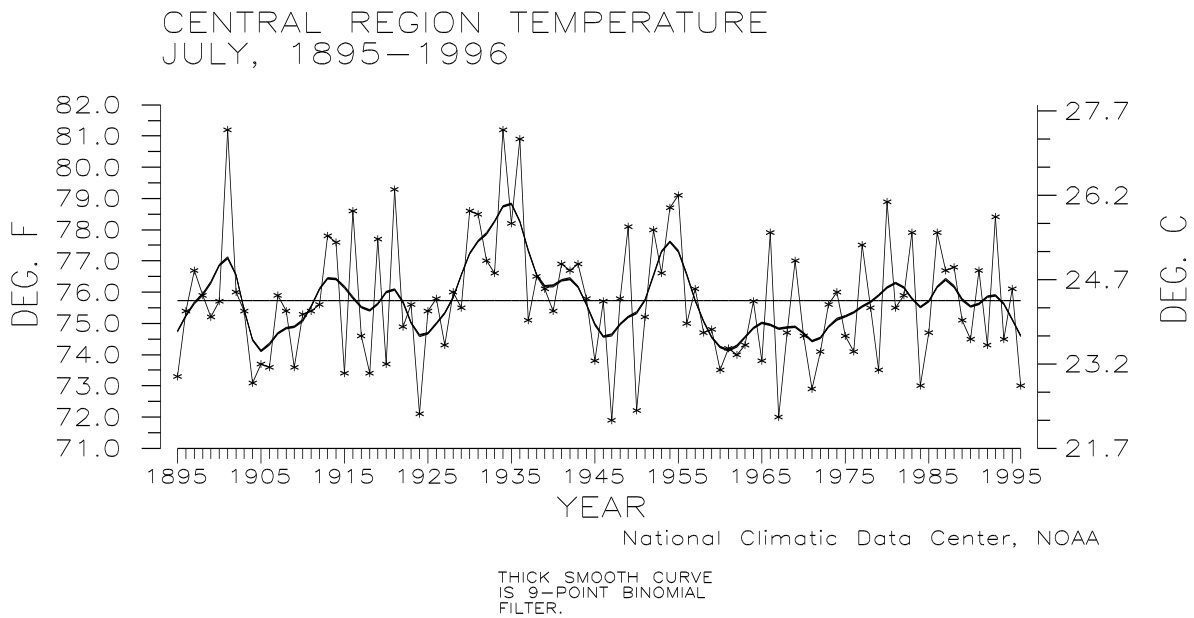


Figure 5: July 1996 was the sixth coolest such month since 1895 for the Central region. Both the sixth-month (Feb-Jul) and twelve-month (Aug 1995-Jul 1996) periods rank as the 18th coolest respectively (Table 1).

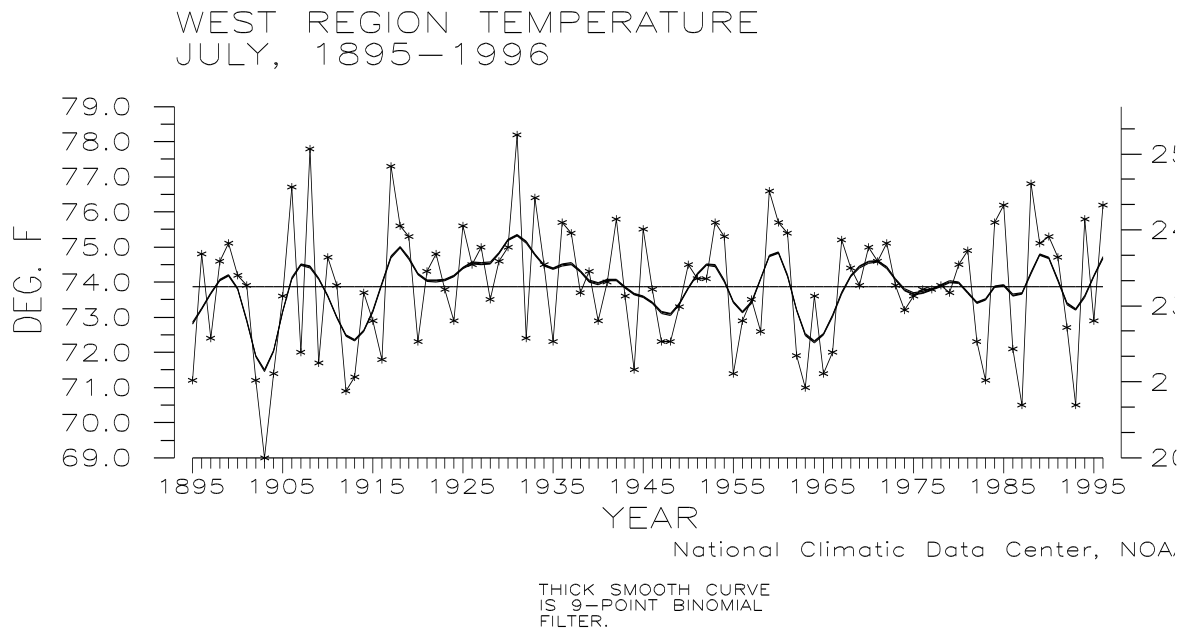
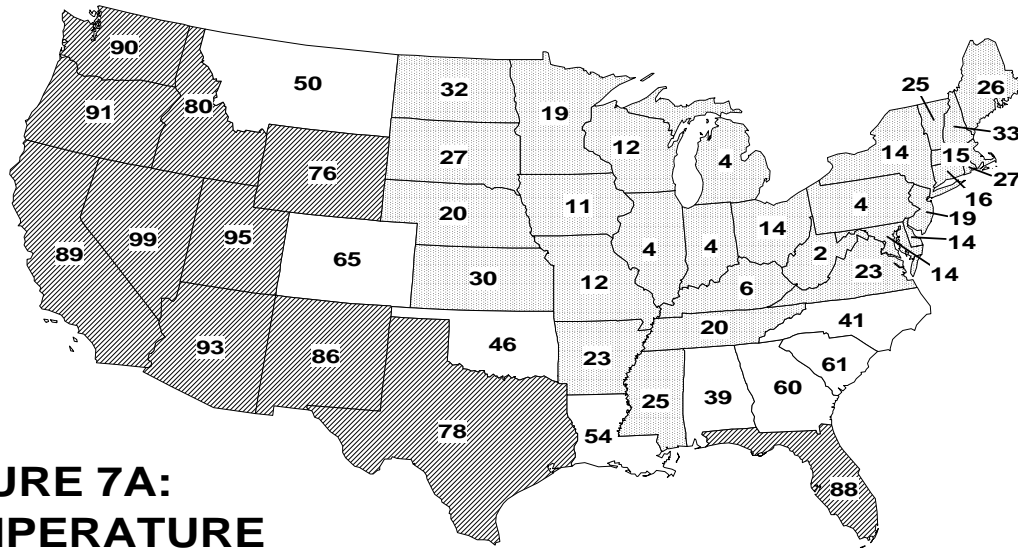


Figure 6: July 1996 was the ninth warmest such month since 1895 for the West region. The six-month period, February-July ranked as the sixth warmest such period and the last twelve months rank as the third warmest such period since records began (Table 1).

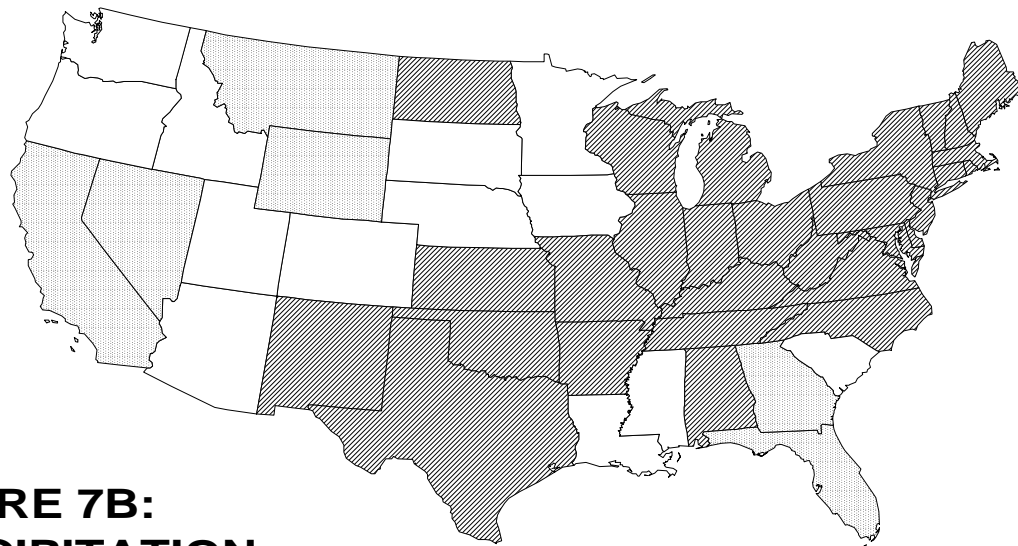
# JULY 1996 STATEWIDE RANKS



**FIGURE 7A:  
TEMPERATURE**

1 = Coldest  
102 = Warmest

Temperature Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the warm third or cool third of their historical distribution are shaded.



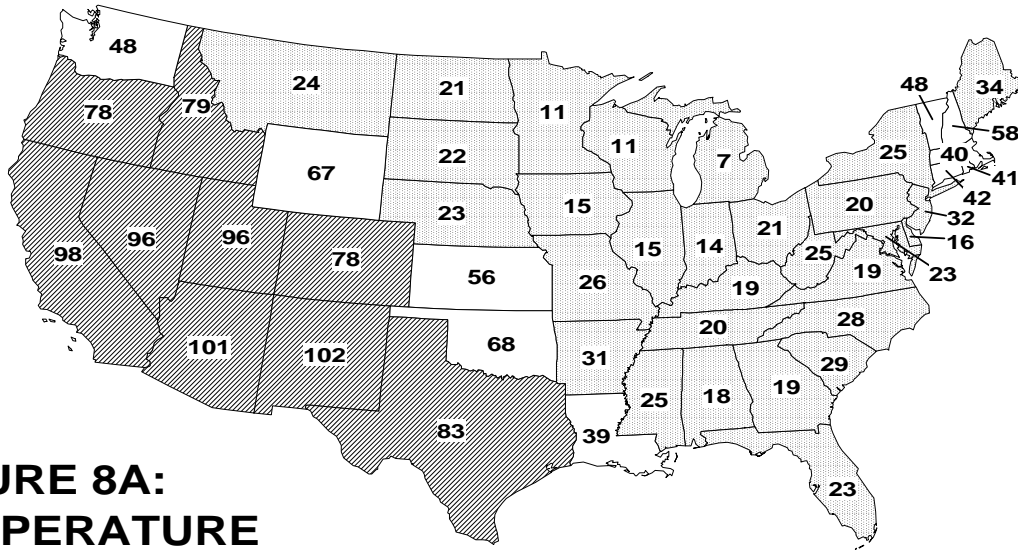
**FIGURE 7B:  
PRECIPITATION**

National Climatic Data Center, NOAA

Wet Third  
Middle Third  
Dry Third

Precipitation Rank Categories for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the wet third or dry third of their historical distribution are shaded.

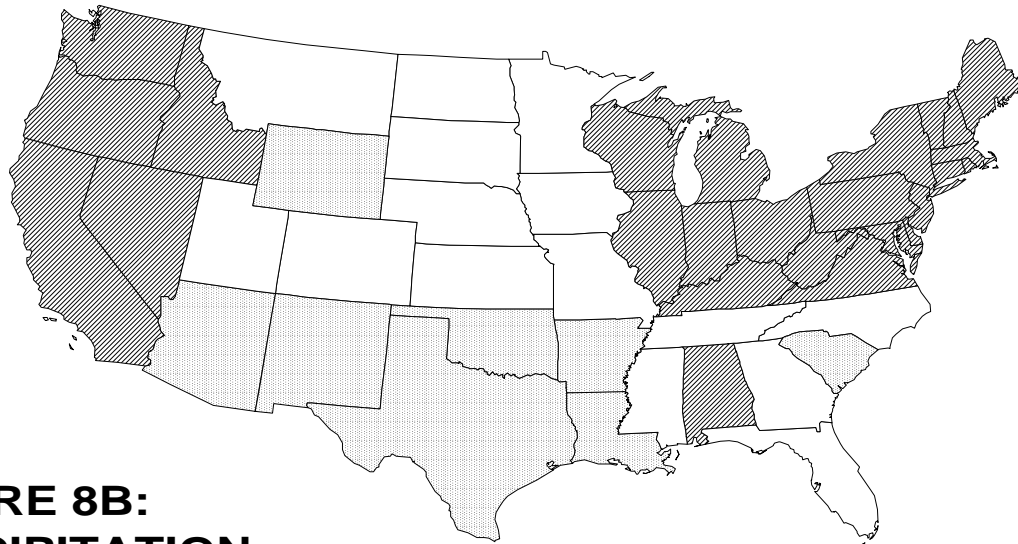
## JANUARY-JULY, 1996 STATEWIDE RANKS



### FIGURE 8A: TEMPERATURE

1 = Coldest  
102 = Warmest

Temperature Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the warm third or cool third of their historical distribution are shaded.



### FIGURE 8B: PRECIPITATION

National Climatic Data Center, NOAA

-  Wet Third
-  Middle Third
-  Dry Third

Precipitation Rank Categories for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the wet third or dry third of their historical distribution are shaded.

Figure 7A shows, in illustrative map form, the July 1996 temperature rankings for the 48 contiguous states. Six states (IL, IN, KY, MI, PA, & WV) were within the top ten coolest while an additional twenty-three ranked within the cool third. Three states (Arizona, Nevada, and Utah) ranked within the top ten warm portion of the historical distribution for July, while seven others ranked within the warm third of the distribution.

July 1996 state categorical ranks for precipitation are shown in Figure 7B. Thirteen states, nearly all in the Northeast, ranked within the top ten wet portion of the historical distribution while an additional 16 states ranked within the wet third. Preliminary data suggests that only Florida ranked within the top-ten dry portion of the historical distribution while six other states ranked within the dry third of the distribution. ***It should be noted that these July state categorical precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

Figure 8A shows the year-to-date temperature rankings for the 48 contiguous states. The 1996 year-to-date is the warmest such period on record for New Mexico, the second warmest for Arizona, fifth warmest for California, and the seventh warmest such period for Nevada and Utah. Four other states ranked within the warm third of the distribution. Twenty-nine states ranked within the cool third of the distribution for the year-to-date including Michigan which had the seventh coolest January-July period on record.

January through July state categorical ranks for precipitation are shown in Figure 8B. Fifteen states ranked within the wet third of the distribution while eight others ranked within the dry third of the distribution. Preliminary data indicate the wettest year-to-date on record for West Virginia and the second wettest such period on record for Indiana, Pennsylvania, and Vermont. These preliminary data also indicate the second driest January-July period on record for Texas and the seventh driest such period on record for Arizona.

Figure 14A shows the ten-month (October 1995-July 1996) temperature ranking for the contiguous United States. The ten-month period is the warmest such period on record for both Arizona and California, second warmest such period for New Mexico, and third warmest for Nevada and Utah. Five other states, all located in the western third of the country, ranked within the warm third of the distribution. Eight states ranked within the top ten coolest for the ten-month period. It was the fourth coolest such period for Michigan, sixth coolest for Delaware, seventh coolest such period for Indiana and Wisconsin, eighth coolest for Alabama and Minnesota, and the ninth coolest for Illinois and Virginia. Twenty-two other states ranked within the cool third of the distribution for the ten-month period.

October 1995 through July 1996 state categorical ranks for precipitation are shown in Figure 14B. Twenty-five states ranked within the wet third of the historical distribution while eleven states ranked within the wet third of the distribution.

***It should be emphasized that all of the temperature and precipitation ranks on these maps and in Table 1 are based on preliminary data. The ranks will change when the final data are processed.***

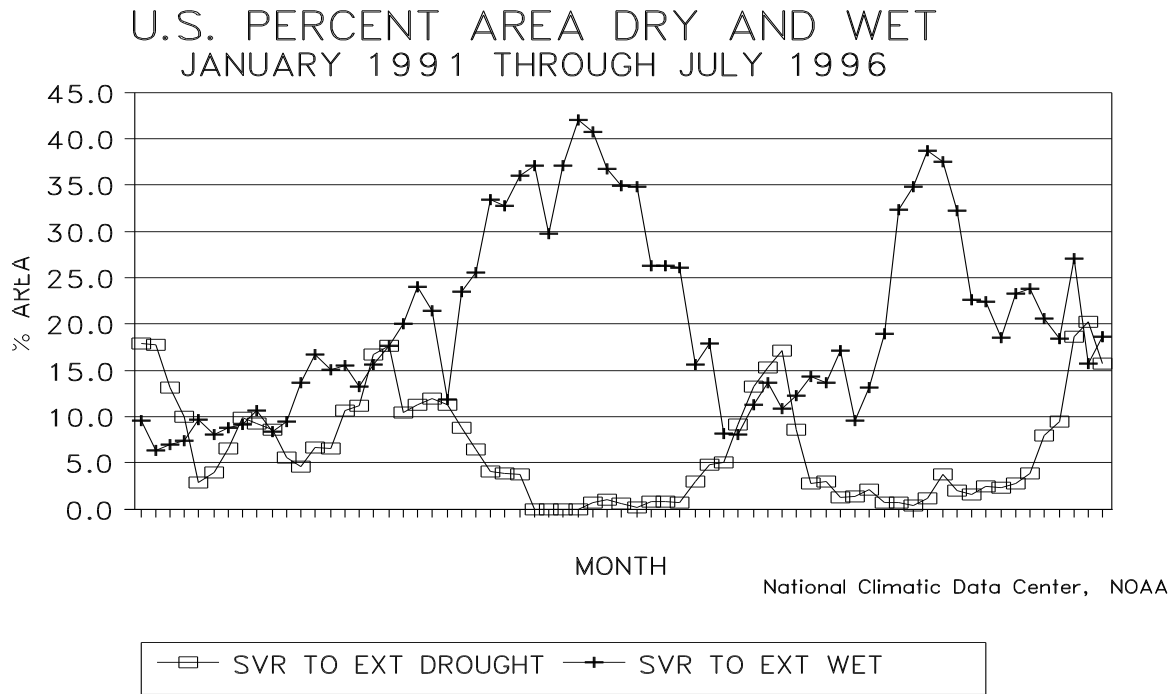


Figure 9: Long-term drought coverage (as measured by the Palmer Drought Index) during July decreased slightly while the percent area of the country experiencing severe to extreme wetness increased slightly. About 19% of the country experienced very wet conditions while about 16% was in severe to extreme drought by the end of July 1996. Core wet areas included portions of the Northeast, upper Mid-West, Great Basin, and the Pacific Northwest while dry areas included much of Texas and Arizona, and parts of Utah, New Mexico, California and Nevada.

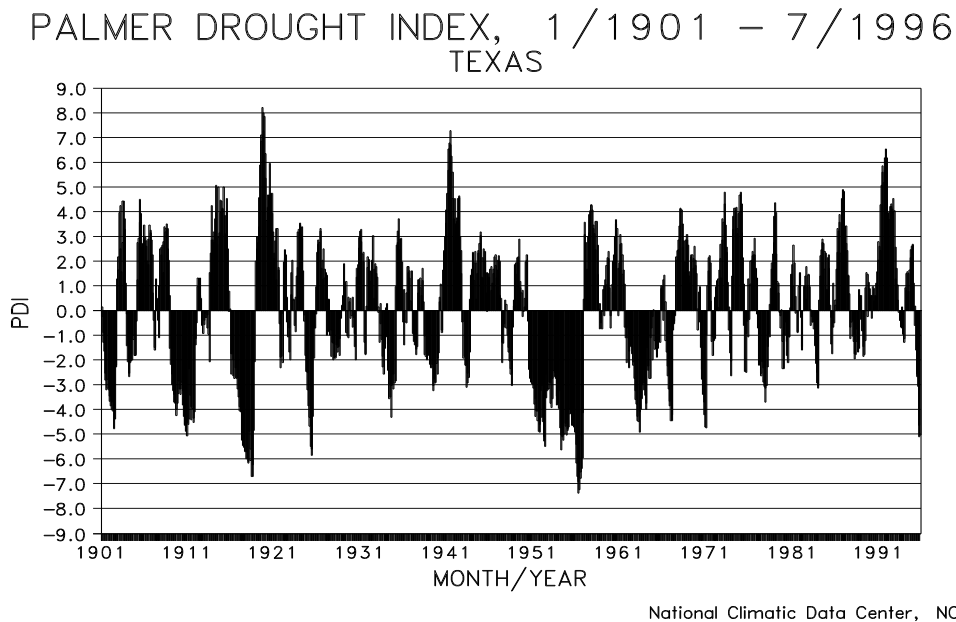


Figure 10: The rapid onset of drought conditions in Texas parallel those seen in the 1950's and 1960's. Convective-type rains during July provided relief to some drought-parched areas but the Palmer Drought Index for Texas still remained well within the extreme drought category (near -5).

## % OF NORMAL MONTHLY PRECIPITATION JANUARY 1995 – JULY 1996

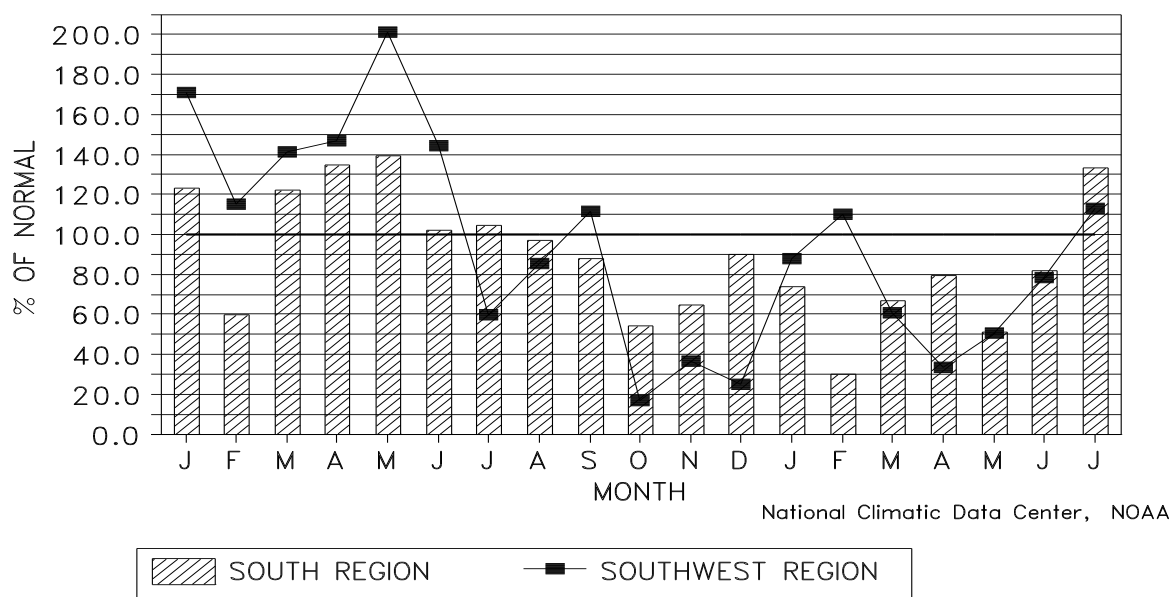


Figure 11: The South region exceeded 100 percent of the normal monthly rainfall for the first time in a year during July 1996. The Southwest region had been running monthly deficits consistently (except for February 1996) since October 1995 until July when this region also exceeded the normal July rainfall.

## SOUTHWEST REGION PRECIPITATION OCTOBER–JULY, 1895–96/1995–96

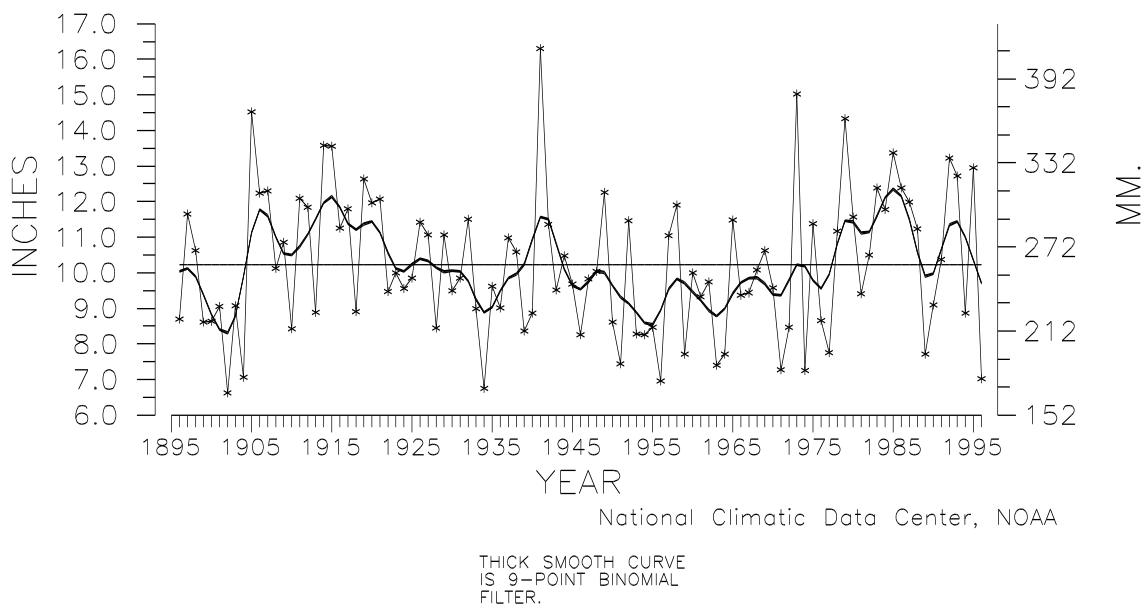


Figure 12: The October 1995-July 1996 period continued to show the high variability in precipitation for the Southwest region. October 1995-July 1996 was the fourth driest such period since records began and rivals those seen around the turn of the century and again in the 1930's, 1950's, and 1970's.

# SOUTH REGION PRECIPITATION OCTOBER–JULY, 1895–96/1995–96

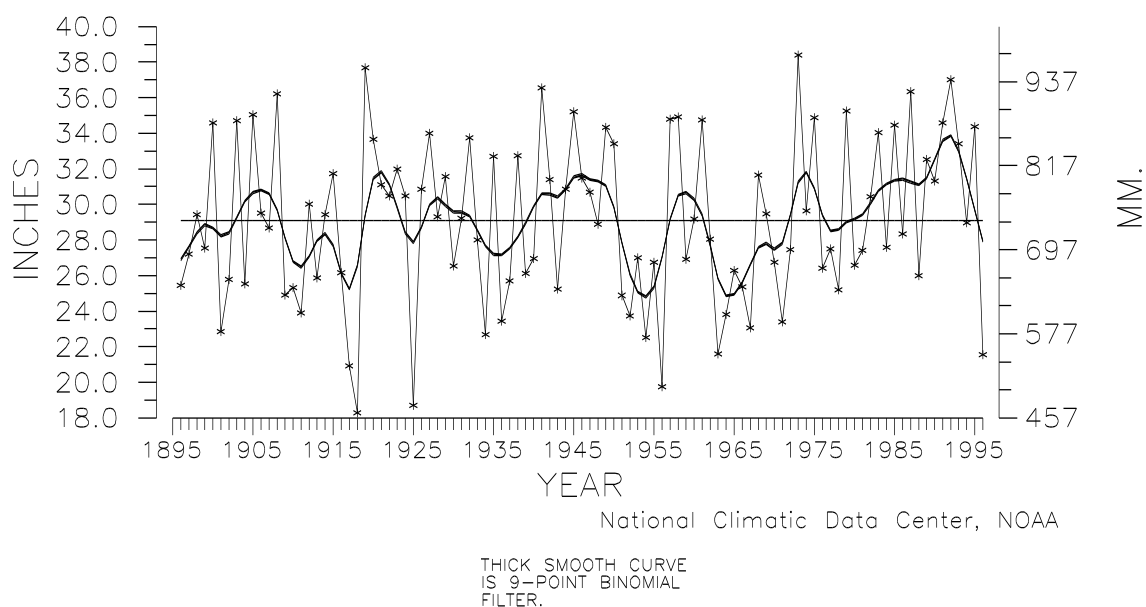
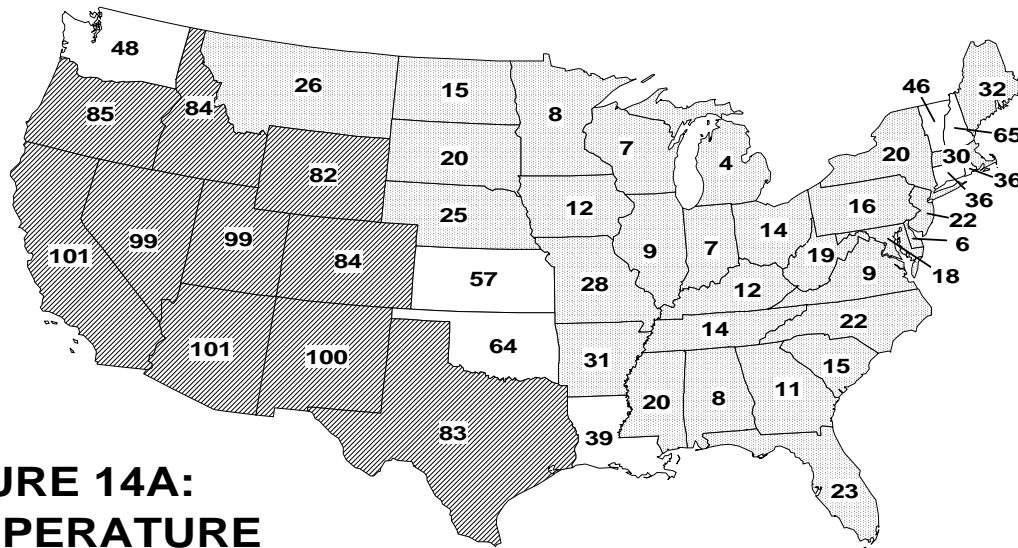


Figure 13: The October 1995–July 1996 period in the South Region is comparable to similar such periods of the late teens, mid-1920's, and early to mid-1950's, in terms of dryness. Preliminary data indicate that October 1995–July 1996 was the fifth driest such period on record for the South Region.

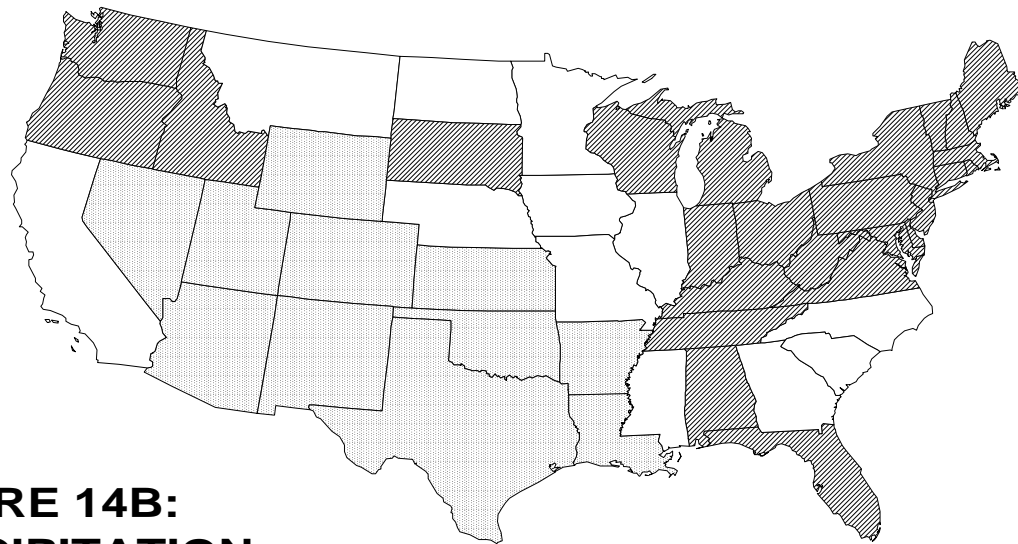
# OCTOBER 1995-JULY 1996 STATEWIDE RANKS



**FIGURE 14A:  
TEMPERATURE**

1 = Coldest  
101 = Warmest

Temperature Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the warm third or cool third of their historical distribution are shaded.



**FIGURE 14B:  
PRECIPITATION**

National Climatic Data Center, NOAA

Wet Third  
Middle Third  
Dry Third

Precipitation Rank Categories for the contiguous United States. Each state is ranked based on its data from 1895-1996. States having a rank in the wet third or dry third of their historical distribution are shaded.



# **PALMER DROUGHT INDEX** **Long-Term Conditions** **as of July 1996**

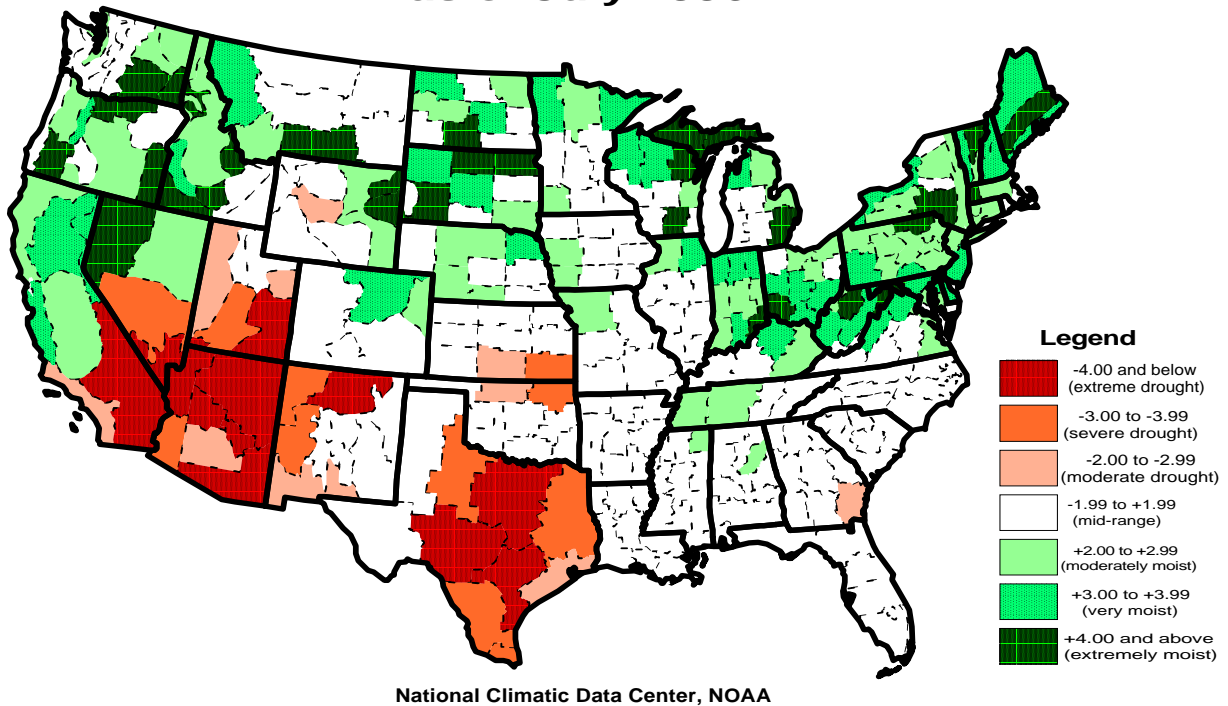


Figure 15: The Palmer Drought Index (PDI) is a measure of how the long-term, or cumulative, water supply (mainly precipitation) in an area compares to its water demand (mainly evapotranspiration). This water balance model was developed by Wayne Palmer in the 1960's and has become widely used in the United States. PDI values less than zero indicate water demand is greater than supply, with values less than -3.00 indicating severe to extreme drought (shaded red above). Positive values indicate water supply is greater than demand, with values greater than +3.00 indicating severe to extreme wet spell (shaded green above).

The PDI map for July 1996 shows a large area of severe to extreme drought stretching from the Desert Southwest and the intermountain basin to the southern Plains. Severely to extremely wet conditions exist from the Pacific Northwest and northern California to the northern Plains, and across parts of the Ohio Valley to the Northeast.